

RIBOSE

Scientific Name: Beta-D-ribofuranose

Common Names: D-ribose

Historical Perspective: Ribose, a relatively new dietary supplement, has recently gained popularity among athletes and the attention of nutritional scientists. Animal studies and clinical research on ribose started in the 1980's.

Common Uses Ribose is a common energy source as a five-carbon sugar (pentose) that the body makes from food. Ribose is also available from ripe fruits and vegetables.

Investigational Uses: There is some evidence that supplemental ribose might prevent muscle fatigue in people with genetic metabolic disorders that prevent sufficient energy production by the body in the form of adenosine triphosphate (ATP). It might also provide extra energy to the heart during exercise in people with coronary artery disease. Because of the positive outcome in some research on patients with heart disease, the thought is that ribose might improve all types of athletic performance. Like the still-popular dietary supplement creatine, ribose is said to delay fatigue and speed exercise recovery by restoring muscle levels of energy in the form of ATP.

Form(s) Used: Ribose supplements can be purchased in pill, powder, or liquid forms, with powders being the most popular. There are some preparations available now containing both ribose and creatine.

Common and/or Recommended Dosage: Recommendations for daily supplementation range anywhere from 3 to 60 grams per day. Sports supplement manufacturers typically recommend two doses per day each of 2 to 10 grams. Most research studies, on the other hand, utilized 16 to 36 grams per day taken in four doses. The clinical research done on cardiac patients and individuals with genetic disorders used doses higher than 60 grams per day, which were often introduced into the vein rather than taken orally. Daily supplementation at that level would be quite costly considering that a bottle containing 100 grams of ribose costs between \$30 and \$75.

Potential Side Effects: Orally, ribose can cause diarrhea, decreased blood sugar (hypoglycemia), intestinal discomfort, nausea and headache. Introduction of ribose directly into the vein (intravenously) can cause hypoglycemia, slightly increased blood insulin levels, and decreased blood phosphate levels.

Food Drug Interactions: People taking medications for diabetes may have to adjust the medication to prevent low blood sugar. People taking certain antidepressants called monoamine oxidase inhibitors (MAOIs), aspirin, and any other drugs that may cause low blood sugar, such as alcohol and propranolol (Inderal), should avoid ribose. There are no known interactions with food, herbs, or dietary supplements.

Contraindication to Use: Children and pregnant or breastfeeding women should not use ribose. People with diabetes and low blood sugar should also avoid ribose.

Research Data on Safety and Efficacy: If delivered intravenously, ribose is likely effective when used to improve exercise tolerance and energy stores in heart and muscle cells in individuals with reduced blood flow in the heart, such as patients with coronary artery disease. Intravenous ribose is also likely effective to prevent symptoms such as cramping, pain and stiffness after exercise in patients with the genetic metabolic disorder myoadenylate deaminase deficiency (MAD). High doses of oral ribose, on the other hand, are possibly effective when used to treat these same two diagnoses. There is insufficient reliable information available about the effectiveness of oral ribose for athletes striving to delay fatigue and speed recovery by restoring muscle levels of ATP.

Bottom-Line: There is a strong biochemical basis for the effectiveness of ribose supplementation. However, the research in healthy human subjects seems to indicate that ribose has little if any ergogenic effect on the performance of high-intensity, short duration exercise. Moreover, ribose likely offers no benefit for aerobic/endurance activities such as running, cycling, or swimming, and it is not effective for decreasing body fat or increasing muscle tissue. Athletes would be wise to invest their time and money in training schedules and equipment rather than spend it on ribose.

References

1. Natural Medicines Comprehensive Database. Jeff M. Jellin (Pharm D). Therapeutic Research Facility, 4th edition, 2002.
2. Beals K, Smith Rockwell M. Ribose: Pure energy or pure propaganda? SCAN'S Pulse. 2002; 21(2): 1-5.